Runoff Solution Lab

Compare solutions that protect soil and water.

S6E6.b "Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each proposed solution. Circle the criteria or observations that show how the team evaluated a solution.

A Creekside School Problem

1. After heavy rain, water rushed from Lincoln Middle School's parking lot into a nearby creek. The fast runoff carried soil from a bare slope, making the creek cloudy. A student team investigated two solutions. One plan was to plant native grasses on the slope. Their roots could hold soil in place, and the plants could slow and soak up some rainwater. The other plan was to cover the slope with pavement, which would stop loose soil but send even more water quickly toward the creek.

2. To compare the plans, the team listed criteria: reduce muddy water, allow rainwater to soak into the ground, cost a reasonable amount, and need little maintenance. They made two small test plots. In the grass plot, water moved slowly and little soil washed away. Water raced across the paved plot. The team chose grasses, then added a shallow rain garden beside the lot. Its plants and soil would collect runoff, filter some pollutants, and let water seep downward to refill groundwater.

3. A solution should be evaluated after it is used. Each month, the team can compare creek cloudiness after rain, check whether soil stays on the slope, and inspect the rain garden for trash or dead plants. If runoff still makes the creek muddy, they might add mulch or more native plants. Protecting soil also protects water quality because less sediment enters the creek. The project does not create new water, but it helps rain soak into the ground, supporting the local groundwater supply.

2 ANSWER WITH EVIDENCE

Use the passage

1. What problem did the team observe, and how did it affect water quality?

2. Which slope plan did the test evidence support? Give one observation and one criterion that support the choice.

3. How could the rain garden help both water quality and water supply?

4. Name two checks the team could make each month. What change could they make if the creek is still muddy after rain?

3 YOUR TURN

Your own words

Choose one problem at your school that affects water, soil, or air. In 5 to 7 sentences, design a solution, explain how it protects the resource, give two ways to evaluate it, and name one change you could make if it does not work well.

ANSWER KEY

Runoff Solution Lab

GRADE 6 · S6E6.b

PART 1 · READ AND MARK

Underline each proposed solution. Circle the criteria or observations that show how the team evaluated a solution. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What problem did the team observe, and how did it affect water quality?	**Runoff from the parking lot carried soil from a bare slope into the creek, making the creek cloudy.**
2	Which slope plan did the test evidence support? Give one observation and one criterion that support the choice.	**The grass plan. Water moved slowly and little soil washed away in the grass plot, so it better reduced muddy water and allowed more rainwater to soak in.**
3	How could the rain garden help both water quality and water supply?	**It can filter some pollutants from runoff, improving water quality, and let water seep into the ground to support groundwater supply.**
4	Name two checks the team could make each month. What change could they make if the creek is still muddy after rain?	**They could compare creek cloudiness, check whether soil stays on the slope, or inspect the rain garden. They could add mulch or more native plants.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Cars wait with engines running near the school entrance, adding exhaust to the air. I would create a signed no-idling zone and ask drivers to turn off engines while waiting. Student volunteers could remind drivers during the first month. The solution should lower the amount of exhaust released near people. To evaluate it, we could count idling cars each week and ask whether fewer people smell exhaust. If many cars still idle, the school could move the waiting area or send families another notice.

Accept equivalent evidence-based explanations that accurately connect runoff control to cleaner water, protected soil, or groundwater recharge. For the open task, accept realistic designs with a resource problem, an expected benefit, two evaluation measures, and a reasonable revision.